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Originally activated
June 1, 1955
Renewed as of July 1956.

TOBACCO INDUSTRY RESEARCH COMMITTEE
150 EAST FORTY SECOND STREET NEW YORK 17, N. Y.

Application For Research Grant

Date: May 1, 1957

1. Name of Investigator: Hurley Lee Motley, M.D.

2. Title: Professor of Medicine and Director Cardio-Respiratory Laboratory, University of Southern California School of Medicine

3. Institution & Address: University of Southern California
3518 University Avenue, Los Angeles 7, California

4. Project or Subject: A Study of the Effects of Smoking on Pulmonary Function.

5. Detailed Plan of Procedure (Use reverse side if additional space is needed):

This application is a request for the continuation of the grant started in June 1955 under a proposed three year plan on the study of the effects of cigarette smoking on pulmonary function in man. As of March 1, 1957, studies have been obtained on a group of 141 cases (all smokers) with an age range of 24 to 70 years (125 men and 16 women). Each case had pulmonary function studies including lung volume determinations and arterial blood and gas exchange measurements, except for three cardiacs and one normal case used in the compliance studies. The above investigations have been described in a paper entitled "Effect of Cigarette Smoke on Pulmonary Function Measurements" and presented before the Annual Meeting of the California Medical Association at Los Angeles, April 29, 1957. A copy of this paper has been sent direct to the Associate Scientific Director, Tobacco Industry Research Committee. During the past year data were obtained at rest in 50 cases using a smoking device so that with each breath some cigarette smoke would be inhaled in the lung with the respiratory gases. The use of the smoking device in the closed circuit insured that the smoke was distributed in the lung and should intensify the acute effects of cigarette smoke. It is desired to extend this type of study to mild exercise. Pulmonary compliance measurements have been obtained on 41 cases, using a continuous cycling method with modifications, recording volume and pressure changes on a Dumont oscilloscope with the loop interrupted by a blanking generator for time, and blips at the no flow points produced by a flow sensitive zero pressure device. The loop was photographed with a Polaroid Land Camera. Patients were studied in the sitting position during spontaneous quiet breathing, before and immediately after smoking one cigarette. There was a significant decrease in compliance after smoking in 56% of the group, while 27%

5. showed no change and 17% demonstrated an increase in the smoking compliance. Further studies of the effect of cigarette smoking on pulmonary compliance are indicated in relation to the work of breathing in an attempt to delineate those changes due to vascular both in the greater and lesser circulation as compared to the direct effect on the respiratory mechanism. In two cases follow-up studies were obtained on emphysema subjects after smoking cigarettes had been stopped voluntarily and as far as can be determined, no medication had been taken during the non-smoking period which might be a factor in altering the pulmonary function measurements. It is hoped to obtain more follow-up studies of this type. The effect of sublingual administration of measured doses of nicotine on pulmonary function measurements is planned when the tablets are available. At the present time data on residual air measurements before and after using the smoking device, employing a simplified helium closed circuit method is under way. The helium method is rapid and checks quite closely with the oxygen open circuit method in this laboratory. No measurements have been obtained on pulmonary artery pressures while smoking as yet, but it is hoped to obtain some. This was planned on two smokers undergoing cardiac catheterization studies during the past year, but both patients developed reactions during the catheterization procedure and the smoking test was not performed. Studies are under way using the nitrogen meter and continuous recording of nitrogen wash-out for seven to ten minutes before and after using the smoking device with one cigarette. The overall studies are directed in trying to determine the nature of the changes thus far observed from inhaling cigarette smoke on lung function, whether it be bronchospasm, edema changes in the bronchiolar wall or circulatory changes especially in the pulmonary circulation.

6. Budget Plan:

Salaries	$10,000.00
Expendable Supplies	3,000.00
Permanent Equipment	
Overhead (15.3%)	2,000.00
Other	
Total	$15,000.00

7. Anticipated Duration of Work: One more year to complete as planned.

8. Facilities and Staff Available:

The Cardio-Respiratory Laboratory is located in the Hospital of the Good Samaritan, 1212 Shatto Street, Los Angeles 17, Calif. This laboratory is equipped for pulmonary function studies of all types, including cardiac catheterization. The director, fellow, three technicians and secretary are all on a full time basis. Dr. Paul Kotin and his entire staff are consultants, who are engaged in the study of the Biologic Effects of Air Pollution.

9. Additional Requirements:

10. Additional Information (Including relation of work to other projects and other sources of supply):

Our association with the Biologic Effects of Air Pollution projects provides experimental and clinical subjects for the study of respiratory function following experimental and naturally occurring exposure to air pollutants. This phase of the work is being supported as part of the air pollution study.

Signature /s/ Hurley L. Motley, M.D.
Director of Project

/s/ Robert D. Fisher
Business Officer of the Institution
Financial Vice President

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